CLAIMS

1. An apparatus comprising:

a lens having an index of refraction that varies in response to a focusing stimulus;

an actuator in communication with said lens for providing said focusing stimulus;

a rangefinder for generating, from a range estimate, a relative distance to an object-of-regard; and

a controller coupled to said rangefinder and to said actuator for causing said actuator to generate a focusing stimulus on the basis of said range estimate.

2. The apparatus of claim **1**, wherein said lens is adapted for implantation in an eye of a human patient.

3. The apparatus of claim **2**, wherein said lens is adapted for implantation at a location in an eye, said location being selected from the group consisting of:

the anterior chamber;

the posterior chamber;

the lens bag; and

the cornea.

4. The apparatus of claim **2**, wherein said lens is adapted for implantation in an aphakic human patient.

5. The apparatus of claim **2**, wherein said lens is adapted for implantation in a phakic human patient.

6. The apparatus of claim **1**, wherein said lens is a foldable lens having a tendency to spring back into an unfolded state.

7. The apparatus of claim **1**, wherein said lens comprises a chamber containing nematic liquid crystal.

8. The apparatus of claim **7**, wherein said chamber comprises a first planar side and a second planar side opposed to said first planar side, said first and second planar sides being separated by a gap smaller than a separation between a lens bag in an eye and an iris in said eye.

9. The apparatus of claim **1**, wherein said lens comprises:

a first lens element;

a second lens element moveable relative to said first lens element; and

a motor coupled to said second lens element for moving said second lens element relative to said first lens element.

10. The apparatus of claim **1**, wherein said actuator comprises a variable voltage source.

11. The apparatus of claim **10**, wherein said actuator further comprises an electrode coupled to said variable voltage source and to said lens for applying an electric field within said lens.

12. The apparatus of claim **1**, wherein said actuator comprises a variable current source.

13. The apparatus of claim **12**, wherein said actuator further comprises a coil coupled to said variable current source and to said lens for applying a magnetic field within said lens.

14. The apparatus of claim **1**, wherein said actuator comprises a plurality of actuating elements coupled to different local regions of said lens for selectively varying said

index of refraction at said different local regions of said lens.

15. The apparatus of claim **14**, wherein each of said local regions of said lens has a local curvature.

16. The apparatus of claim **14**, wherein said actuating elements comprise a plurality of electrodes disposed at different portions of said lens.

17. The apparatus of claim **14** wherein said actuating elements comprise a plurality of coils disposed at different portions of said lens.

18. The apparatus of claim **16**, wherein said plurality of electrodes comprises a plurality of concentric electrodes.

19. The apparatus of claim **16**, wherein said electrodes are disposed in a two dimensional array.

20. The apparatus of claim **19**, wherein said two-dimensional array is a rectilinear array.

21. The apparatus of claim **19**, wherein said two-dimensional array is a polar array.

22. The apparatus of claim **1**, wherein said rangefinder comprises a transducer for detecting a stimulus from an anatomic structure in an eye, said stimulus being indicative of a range to said object-of-regard.

23. The apparatus of claim **22**, wherein said transducer is a pressure transducer for detecting contraction of a muscle.

24. The apparatus of claim **23**, wherein said pressure transducer is a piezoelectric element that generates a voltage in response to contraction of said muscle.

25. The apparatus of claim **23**, wherein said transducer is an electromyograph for detecting electrical activity associated with contraction of said muscle.

26. The apparatus of claim **22**, wherein said transducer is configured to detect a

stimulus from an anatomic structure selected from a group consisting of:

contraction of a ciliary muscle,

tension in a zonule,

mechanical disturbance of a lens bag,

contraction of a rectus muscle, and

dilation of an iris.

27. The apparatus of claim **1**, wherein said rangefinder comprises an autofocus system.

28. The apparatus of claim **27**, wherein said autofocus system comprises:

an infrared transmitter for illuminating an object with an infrared beam;

an infrared receiver for receiving a reflected beam from said object, and

a processor coupled to said infrared receiver for estimating a range to said object on the basis of said reflected beam.

29. The apparatus of claim **27**, wherein said rangefinder further comprises a feedback loop coupled to said autofocus system.

30. The apparatus of claim **29**, wherein said feedback loop comprises:

a first lenslet disposed posterior to said lens, said first lenslet having a first focal length;

a second lenslet disposed posterior to said lens, said second lenslet having a second focal length;

a first photodetector disposed posterior to said first lenslet, said first photodetector in optical communication with said first lenslet and

separated therefrom by a selected distance, said selected distance being between said first and second focal length; and

a second photodetector disposed posterior to said second lenslet, said second photodetector in optical communication with said second lenslet and separated therefrom by said selected distance;

a differencing element coupled to outputs of said first and second photodetectors for determining a difference between signals present on said first and second photodetectors, said difference being indicative of an extent to which said lens is focused on said object-of-regard.

31. The apparatus of claim **1**, further comprising a manual focusing control for enabling a patient to fine tune focusing of said lens.

32. The apparatus of claim **1**, further comprising a power supply for providing power to said rangefinder and said actuator.

33. The apparatus of claim **32**, wherein said power supply comprises a battery.

34. The apparatus of claim **33**, wherein said battery is adapted for implantation beneath the conjunctiva.

35. The apparatus of claim **32**, wherein said power supply comprises a photovoltaic cell.

36. The apparatus of claim **35**, wherein said photovoltaic cell is configured for implantation in a cornea.

37. The apparatus of claim **35**,wherein said photovoltaic cell is configured for mounting on said lens.

38. The apparatus of claim **33**, wherein said power supply comprises a rechargeable battery.

39. The apparatus of claim **38**, further comprising a photvoltaic cell configured to

recharge said rechargeable battery.

40. The apparatus of claim **1**, further comprising a wearable frame to which said lens, said actuator, said controller, and said rangefinder are attached.

41. A method comprising:

estimating a distance to an object-of-regard; and

on the basis of said distance, altering an index of refraction of a lens to cause said lens to have a selected focal length.

42. An apparatus comprising:

a lens having an index of refraction that varies in response to a focusing stimulus; and

an actuator in communication with said lens for providing said focusing stimulus.

43. The apparatus of claim **42**, wherein said lens comprises a plurality of local regions, each of said local regions having a local curvature.

44. The apparatus of claim **43**, wherein said actuator includes a plurality of actuating elements, each of said actuating elements in communication with a subset of said local regions.

45. The apparatus of claim **44**, wherein said actuating elements are independently addressable.

46. The apparatus of claim **44**, wherein said actuating elements are disposed in a two-dimensional array on said lens.

47. The apparatus of claim **42**, further comprising a controller coupled to said actuator for enabling a wearer of said lens to control said focusing stimulus.